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# ROLE OF METACOGNITION AND LOCUS OF CONTROL IN ACADEMIC ACHIEVEMENT: A COMPREHENSIVE REVIEW

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## ABSTRACT

Education is regarded as a process of human development which on one hand is aimed at developing a balanced personality of students and on the other, playing a leading role in shaping, reforming and transforming the society with time. Among the major goals of education, the one that is of prime concern is developing the capacities and potentialities of students to empower them with all powerful necessities in making a noticeable mark in any field. Education is generally seen as the foundation of society which brings economic wealth, social prosperity and political stability. Development of any nation largely depends upon the quality of education that is accessible to its citizens. Education is an investment and academic achievement is a major aspect of it. Over the past decades infinite emphasis has been placed on academic achievement of children. It has become a desired outcome of schooling and a lot of time and effort is devoted to it. Academic achievement is treated as an index of a child's future in a highly competitive world. It is a multidimensional and multifaceted phenomenon influenced by a number of factors like intelligence, learning ability, creativity, personality, school environment, metacognition, locus of control, etc. Metacognition refers to higher order mental processes involved in the process of learning. It is the student's own awareness and consideration of one's cognitive processes and strategies (Flavell, 1976). Locus of control refers to a student's perception about the underlying root causes of his/her academic successes or failures (Rotter, 1966, 1975). This paper reviews the role of these two factors in academic achievement, and suggests strategies and approaches to develop and modify them.

**KEYWORDS:** Academic Achievement, Metacognition, Locus of Control, Strategies, Approaches.

**INTRODUCTION:**

Education is the process of developing the capacities and potentialities of individual so as to prepare the individual to be successful in a specific society or culture. Education is meant to make one's life civilized, cultured and progressive in real sense. It helps to draw the best out of mind and spirit and to make one rational, innovative, constructive, intelligent, independent and creative. It imparts one with all the power of necessities in making a noticeable mark in any field. It is generally seen as the foundation of society which brings economic wealth, social prosperity and political stability. Education is an investment which is most commonly measured in terms of academic achievement. Hence, academic achievement occupies a very important place in education as well as in the learning process. Academic development of students is the primary concern and the most important goal of education. It is the unique responsibility of all educational institutions established by the society to promote a holistic scholastic development of students. In present times, it is the academic performance of students which decides their fate. So it becomes increasingly important for them to perform well in all aspects of academics particularly, in examinations to progress in life.

Academic achievement is the extent to which a learner is profiting from instructions in a given area of learning. It also denotes the knowledge attained and skill developed in the school subjects, usually designed by test scores (Crow and Crow, 1969). The term academic achievement refers to instructional system of formal education within school, college or university (Hawes and Hawes, 1982). It measures or assesses the status or level of an individual's skill, the range and depth of his/her knowledge or proficiency in a designated area of learning or behaviour. It is measured and assessed by achievement tests and compared to set norms to evaluate his/her performance. These tests may be created or standardized (Hurlock, 1989).At its best, academic achievement represents intellectual ability to participate in the production of knowledge. At its worst, academic achievement represents inculcation and mindless indoctrination of the young into the canons and orthodoxy (Landson-Billing, 1999). Academic achievement is a multidimensional and multifaceted phenomenon and is influenced by a multitude of factors like intelligence, personality, motivation, school and home environment, socio-economic status, cognitive styles, study habits, self-efficacy, level of aspiration, self-esteem, metacognition, locus of control, self-concept, creativity, etc. This paper discusses the role of metacognition and locus of control in academic achievement and lists the strategies and approaches to develop and modify them.

**Metacognition:**

Educational psychologists have long promoted the importance of metacognition for regulating and supporting student learning. Metacognition refers to a level of thinking that involves active control over the process of thinking that is used in learning situation. It refers to the psychological processes that are involved in the way a person controls, modifies, and appraises his own thoughts.

According to Flavell (1976), metacognition consists of both metacognitive knowledge and metacognitive regulation. Metacognitive knowledge refers to acquired knowledge about cognitive processes, knowledge that can be used to control cognitive processes. Flavell further divided metacognitive knowledge into three categories: (i) person variables or knowledge about one's self and other's thinking (ii) task variables or knowledge that different types of tasks exert different types of cognitive demands and (iii) strategy variables or knowledge about cognitive and metacognitive strategies for enhancing learning and performance (Flavell, 1979, 1987). Metacognitive regulation involves the use of metacognitive strategies which are sequential processes that one uses to control cognitive activities and to ensure that a cognitive goal has been met. These processes help to regulate and oversee learning and consist of planning and monitoring cognitive activities as well as checking the outcomes of those activities (Kaur, 2010).

Metacognition can be described as a higher order cognitive structure, i.e. knowledge and processes that control, execute, and evaluate cognition. Metacognition is a superior system that encompasses a person's self-awareness of his/her cognitive functions and facts and that enables a person to purposefully direct these functions and facts.

**What research says?**

Romainville (1994) conducted an exploratory research project on first-year university students' meta-cognition. A relationship was found between academic performance and students' meta-cognitive knowledge characteristics.

Landine and Stewart (1998) studied relationship between metacognition and academic achievement and found that there exists significant positive relationship between both the variables.

Ponnusamy (2006) conducted a study which showed that metacognitive strategies had a significant impact on academic achievement.

Zulkiply (2006) discussed metacognition and its relationship to students' academic performance. The findings revealed a significant positive relationship between students' academic performance and metacognitive awareness.

Coutinho (2007) examined the relationship between metacognition and academic success. The results showed that there was a weak relation between metacognition and academic achievement.

Simsek and Balaban (2008) conducted a study to assess the most commonly used learning strategies of undergraduate students and how these strategies were related to their academic performance. He found that the most preferred group of strategies was the metacognitive strategies.

Young and Fry (2008) examined the Metacognitive Awareness Inventory (MAI) to determine how it relates to broad and single measures of academic achievement in college students. Significant correlations were found between the MAI

and broad measures of academic achievement.

Ibe (2009) conducted a study on effects of metacognitive strategies on classroom participation and student achievement in senior secondary school science classrooms. Results revealed that the metacognitive strategies were most effective in enhancing academic achievement.

Sami and Ozgul (2009) investigated the relationship between science achievement and metacognition and found that for 4th grade to 8th grade students, knowledge of cognition and regulation of cognition contributed to science achievement.

Gulsum et al. (2010) investigated the contribution of metacognitive strategy use to students' science achievement and found that it made a significant contribution.

Kaur (2010) conducted a study of learning outcomes of adolescents in relation to their metacognition and found that there was a positive and significant relationship between academic achievement and metacognition. The results lead to the inference that adolescents with high metacognition were good in academic achievement but adolescents with low metacognition were not so good in their academic achievement.

Menderes (2010) tested the relationship between the meta-cognitive learning strategies and academic achievement of university students. It was revealed that the higher level of students' awareness, the more successful they are in their courses.

Nbina and Viko (2010) examined the effect of instruction in metacognitive self-assessment strategy on senior secondary school students' chemistry achievement and reported that it improved the achievement.

Ndidiamaka (2010) studied the relationship between metacognition and academic success. Findings of the study showed that metacognition is related to academic success and students with good metacognition have good GPAs.

Sperling et al. (2012) studied the predictive ability of metacognition in middle school learners and found it to be a significant predictor of science achievement.

Eluemuno (2013) investigated the effect of metacognitive skills on academic performance of senior secondary school students in Anambra state, Nigeria. The study revealed a positive relationship between metacognitive skills and academic performance such that developing metacognitive skills of a student will lead to the improvement of his/her academic performance.

Narang (2013) studied the impact of metacognition on academic performance of rural adolescents (13-16 years). Results revealed that the major proportion of subjects with high level of metacognition also performed above average in academics. Further, analysis depicted that both the components of metacognition viz. 'Knowledge of Cognition' and 'Regulation of Cognition' significantly contributed towards the academic performance of the adolescents.

Rani (2013) explored the relationship between metacognition and academic achievement of undergraduate students and the findings of the study revealed that the high and low achieving students differ significantly on their metacognitive level.

Gomes et al. (2014) investigated the role of specific and general metacognitive ability on specific and general academic achievement of $6^{th}$ to $12^{th}$ graders from a private Brazilian school. Results revealed that the general metacognitive ability explained general academic achievement and specific metacognitive ability explained specific academic achievement.

Sajjadi et al. (2015) aimed to find out relationship between metacognition and academic success among high school students and moderate relation was found between both the studied variables.

Sawhney (2015) undertook a study to find out the relationship between metacognitive awareness and academic achievement of undergraduate students. The findings revealed a significant difference in academic achievement of undergraduate students with high and low scores in metacognitive awareness.

Sonowal and Kalita (2019) in their study on higher secondary students of Dibrugarh, Assam reported positive correlation between metacognitive awareness and academic achievement, and between regulation of cognition and academic achievement.

Aloqleh and Teh (2019) in their study on Jordanian Universities' students found that metacognition dimensions had a positive predictive effect on academic achievement.

Abdelrehman (2020) conducted a study on Ajman University students and found that metacognitive awareness is a major contributor to success in learning and represents an excellent tool for measurement of academic performance.

**Strategies for developing metacognition in students:**
According to Nair, Sudharma & Poulose (2004), following strategies can be used for developing metacognition in students:

- **Planning Strategy:** Prior to any learning activity, teachers should point out strategies and steps for tackling problems, rules to remember and directions to follow.
- **Choosing consciously:** Teachers can provide the students with chances to select their own choices for learning and select appropriate methods for fruitful learning.
- **Modelling:** The probability of greatest influence on students is that of teachers modelling. Modelling and discussion develops the vocabulary that the learners need for thinking and talking about their own thinking. The teachers who publicly demonstrate metacognition produce students who do the same.
- **Asking thought provoking questions:** It causes students to define their terminology operationally and examine the premises on which their thinking is based. It is also helpful to clarify their problem solving processes.
- **Clarifying students' terminology:** Students often use hollow, vague and non- specific terminology. Teachers need to clarify them in detail so that the meaning and values are explained to the full extent.
- **Paraphrasing:** Teachers should invite students to restate, translate, compare and paraphrase ideas of other people. It would lead them to become not only better listeners of other's thinking, but also better listeners of their own thinking as well.
- Evaluation, planning and regulation help students gain executive control of behaviour. These processes should take place at before, during and after stages of task.

**Locus of Control:**
Locus of control, a personality construct derived from social learning theory, seeks to explain human behaviour over a wide spectrum of situations related to learning and achievement (Lefcourt, 1976, 1982; Rotter, 1966). Rotter proposed that the potential for human behaviour is a function of generalized expectancies that one's behaviour will elicit valued reinforcement. When reinforcement is perceived by the individual as following some action of his/her own but not being entirely contingent upon his/her action, then, it is typically perceived as the result of luck, chance, fate, and under the control of powerful others.When an individual interprets the event in this way, it is labelled as belief in external control. If the person perceives that the event is contingent upon his/her own behaviour or his/her own relatively permanent characteristics, then, it is termed as a belief in internal control.

Locus of control is not a specific, dichotomous internal or external characteristic; but rather a general, global construct along a continuum. Stronger levels of internality are attributed to variety of behavioural outcomes including higher levels of academic achievement. It is suggested that expectancies have an impact on an individual's motivational and cognitive reactions. These motivational and cognitive reactions, in turn, may influence an individual's achievement performance (Bar-Tal & Bar-Zohar, 1977). Research associates internality in locus of control with more consistent demonstration of cognitive and motivational strategies associated with effective learning including:

- Better assimilation, structuring, and use of information
- Greater independence in self-regulating learning: developing, selecting, structuring, and monitoring learning strategies
- Higher expectations and self-evaluation with more positive self-reinforcements
- Better recall of performance, ability to use experience to improve future performance, and accurately project future performance.

**What research says?**
The first investigation to correlate locus of control with academic achievement was reported by Crandall, Katkovsky and Preston (1962) where they found that when performance on achievement tests were correlated with the locus of control variable, significant correlation was found between the two.

Chance (1965) with the same tests found a similar pattern of correlations. In later studies by Crandall, Katkovsky and Crandall, (1965) McGhee & Crandall, (1968), the locus of control scores were found to be significantly related to total achievement test scores.

Nowicki and Roundtree (1971), on administering the Nowicki-Strickland Scale for Children to $12^{th}$ grade students found that locus of control is related to achievement for males and involvement in extracurricular activities for females.

Clifford and Cleary's (1972) examination of the relationship between measures of internality resulted in a significant positive correlation with academic performance.

Brown and Strickland (1972) using introductory psychology students as subjects, found internality associated with high grades for males but not for females. Nowicki and Strickland (1973) and Duke and Nowicki (1974) found externality associated positively with achievement for females but internality was related with achievement for males negatively.

Procink and Breen (1975) reported that they could predict undergraduate grade point average (GPA), making use of Levenson's Locus of Control Scale.

Similarly, Edwards and Walters (1981) internal-external scores on Rotter's I-E Scale correlated to GPA. Harper (1984) in his study on university students concluded that locus of control may be used as a valid predictor of GPA.

Studies done in later decades also show a significant positive correlation between the locus of control construct and academic achievement (Foley & Epstein, 1992; Maqsud, 1993; Khayyar, 1994; Blackner, 2000; Majzub, 2009; Barzegar, 2011; Nejati et al., 2012; Sarwar & Ashrafi, 2014; Abid et al., 2016; Khaleghinezhad et al., 2016; Kupkova 2017).

Locus of Control was found to be a significant predictor of academic achievement of students in studies done by Wilhite (1990), Denise et al. (2006), Jones (2008), Gerlich et al. (2009) and Telle et al. (2009).

Most of the studies established that students having internal locus of control had higher achievement scores than students having external locus of control (Dillie & Mezack, 1991; Foley & Epstein, 1992; Khayyer, 1994; Pascerella et al., 1996; Blackner, 2000; Edmond, 2002; Carden et al., 2004; Shepherd et al., 2006; Graham, 2007; Majzub, 2009; Baron & Cobb-Clark, 2010; Fini & Yousefzadeh, 2011; Kalantarkousheh, 2013; Khir et al., 2015, Alias et al., 2016 ). Contrary to this, Wilhite (1990) in his study found that students having external locus of control had high achievement scores as compared to those having internal locus.

Aggarwal and Berry (1974) designed a study to find out the differences, if any, existed in academic achievement at the high, middle and low levels of locus of control. Analysis of variance applied to the data revealed that high internal control subjects achieved significantly below the level of academic achievement of low internal control subjects.

Mishra (1983) in his study on locus of control and academic achievement of urban, rural and tribal students found out that the relationship between the two variables was positive and statistically significant. Students with internal control secure higher scores academically than students with external locus.

Rao & Moorthy (1984) in their study on college students found that externally controlled subjects tended to be low achievers and that girls were more external than boys.

Gupta (1987) in her study on senior secondary students found that locus of control correlated negatively and significantly with academic achievement, played an important role in predicting and explaining the variance in academic achievement.

Sharma & Chaddha (1989) also found positive significant correlation between locus of control and scholastic achievement of students.

Goyal (2000) found a significant positive correlation between locus of control and academic achievement of 10$^{th}$ grade students.

Das et al (2013) in their study on adolescents found a significant and positive effect of locus of control on their academic achievement, with internals showing higher academic achievement than externals.

Manichander (2014) reviewed previous studies regarding relation between the two variables and observed that a small magnitude of relationship existed between internal locus of control and academic success.

Sharma & Sahni (2014) also found that locus of control significantly affected the academic achievement of students.

Nongtu & Bhutia (2017) reported a moderate and positive correlation between external locus and academic achievement of college students. Locus of control and academic achievement positively and significantly correlated with each other in the studies done by Kumar & Asha (2017) Madangopal & Thenmozhi (2017). Academic achievement of internal locus students differs significantly with academic achievement of external locus students (Kumar & Asha, 2017). Internal locus is a positive predictor and external locus is a negative predictor of academic performance (Madangopal & Thenmozhi, 2017).

**Approaches to modify locus of control in students:**

The following approaches can be adopted for helping students with their locus of control:

- Strengthening internal locus of control: Students having internal locus of control recognise their skills and capabilities and control their academic affairs both in school as well as at home. They develop faith in themselves by feeling responsible for their actions. Such students achieve their goals successfully and feel more satisfaction and happiness. Educators may use a variety of strategies to encourage students to believe they have more control over their education and academic achievement, including techniques known as 'attribution training'. Essentially, with such interventions, students are taught to internalise positive messages that tend to be intuitive to students with an internal locus of control.

- Altering learning contexts: More structured, orderly and supportive learning environments are believed to benefit students with an external locus of control, while students with an internal locus of control often thrive in more unstructured learning environments.

School-based intervention programmes, Behavioural modification techniques, Change programmes, etc. hold some promise in modifying control orientations. These programmes should include important people in the life of students like teachers, parents and friends because such relationships are instrumental in the development and maintenance of locus of control.

**CONCLUSION:**

As discussed, one of the major goals of education is optimal development of students into balanced personalities so as to empower them to reform and transform society and nation with time. The quality of education imparted to them needs to be upgraded in a manner which improves their academic achievement. For this, factors which impact and influence their achievement need to be focussed upon. Metacognition and locus of control are two such factors which have been proved to significantly affect academic achievement. Therefore, strategies and approaches to develop and modify them in students need to be worked upon to accomplish the goals of education in the long run.

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